

**BEFORE  
THE PUBLIC SERVICE COMMISSION OF  
SOUTH CAROLINA  
DOCKET NO. 2018-\_\_-E**

In Re:	)	
	)	
Application of Duke Energy Carolinas, LLC	)	<b>APPLICATION FOR APPROVAL OF</b>
for Approval of Proposed Electric	)	<b>PROPOSED ELECTRIC</b>
Transportation Pilot and An Accounting Order	)	<b>TRANSPORTATION PILOT AND AN</b>
to Defer Capital and Operating Expenses	)	<b>ACCOUNTING ORDER TO DEFER</b>
	)	<b>CAPITAL AND OPERATING</b>
	)	<b>EXPENSES</b>
	)	

Pursuant to S.C. Code Ann. § 58-27-820, S.C. Code Ann. Regs. 103-823, and other applicable rules and regulations of the Commission, Duke Energy Carolinas, LLC (“DE Carolinas” or the “Company”) hereby applies to the Public Service Commission of South Carolina (the “Commission”), for approval of the Company’s proposed electric transportation pilot (“ET Pilot” or the “Pilot”) described herein. Pursuant to S.C. Code Ann. § 58-27-1540, the Company also seeks an accounting order for regulatory and financial accounting purposes authorizing the Company to defer in a regulatory asset the related depreciation expense, property tax, and incremental operation and maintenance (“O&M”) expenses, as well as the carrying cost on the investment and on the deferred costs at its weighted average cost of capital, incurred in connection with the ET Pilot until the Company’s next general rate case following deployment of the ET Pilot.

The adoption of electric vehicles in the United States is growing at a significant pace, and the Company recognizes it must prepare to provide for and better understand the electrical needs of this growing population. In 2011, DE Carolinas sought and received approval by the Commission to conduct a plug in electric vehicle (“EV”) charging station pilot, where the

Company provided charging stations and up to \$1,000 of installation fees to 150 residential customers who bought or leased a plug-in electric vehicle in the Company's service area in exchange for collecting data about their charging behaviors for a two-year period. By the conclusion of the pilot, the Company was able to analyze and begin to understand the distribution impact and potential ways to mitigate those impacts as electric vehicles come into its service territory; the technical capabilities the charging stations can offer to help mitigate those potential impacts; and when, where, how long and how often a customer charges their EV.<sup>1</sup> DEC also learned that the market for EVs continues to grow as more models become available and that EV adoption has been occurring at more than twice the rate of traditional hybrids when they were first released. As explained in further detail below, the Company is now proposing to offer the ET Pilot in anticipation of the accelerated deployment of EV technology and the potential customer benefits of increased EV adoption in the State of South Carolina. Specifically, to ensure the multiple types of charging technologies for EVs are integrated safely, reliably and cost-effectively, the Company needs to better understand the grid impacts of serving EV charging equipment, customer charging behavior and the viability of utility-managed charging methods.

The Company also believes that increased adoption of electric transportation in South Carolina could lead to less expensive energy costs for its customers. As electric sales from the charging of EVs continues to increase, utility net revenues from the sale of EV charging will also increase without adversely increasing the cost of service if charging load can be effectively managed, which should result in downward pressure on utility customer rates, all else being

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<sup>1</sup> See Order No. 2011-436 in Docket No. 2011-114-E.

equal. Further, as more EVs are adopted, consumer cost savings from reduced fuel and maintenance costs will also increase.

The ET Pilot is composed of four programs designed for residential and nonresidential customers interested in exploring the benefits that a greater penetration of EVs and ET infrastructure may unlock while seeking opportunities to help offset the costs of procuring EVs and ET equipment. The four programs are: 1) the Residential EV Charging Program; 2) the EV School Bus Charging Program; 3) the EV Transit Bus Charging Program; and 4) the Direct Current (“DC”) Fast Charging Station Program. The main goals of the Pilot are to:

- Install a foundational level of fast charging infrastructure across DE Carolinas service territory in South Carolina;
- Study the effects of charging multiple types of electric vehicles;
- Develop procedures to ensure cost-effective integration of vehicle charging by actively managing charging loads;
- Study how best to support public transit electrification and associated cost savings in South Carolina; and
- Study how to ensure electrification projects benefit all customers, including customers who do not own electric vehicles.

DE Carolinas’ estimated cost of the ET Pilot in South Carolina is approximately \$7.1 million over the program’s proposed initial three years. The cost breakdown per program is as follows:

Residential EV Charging Utility Management Program:	\$0.40M
EV School Bus Program:	\$2.54M

EV Transit Bus Program:	\$1.14M
DC Fast Charging Program:	\$2.61M
Education/Outreach and Ongoing O&M:	\$0.42M

The Company respectfully requests approval of the Pilot 60 days from the date of filing and an effective date for the Pilot 90 days after Commission approval. The Company is requesting expedited approval of the Pilot to ensure it is in position to advocate to the South Carolina Department of Insurance (“SCDOI”) and the SC Department of Education (“SCDE”) to commit to funding the replacement of some of the diesel school buses in South Carolina with electric school buses from South Carolina’s VW Settlement Environmental Mitigation Trust (the “Settlement Trust”).<sup>2</sup> As discussed in detail below, a portion of the ET Pilot is designed to complement the goals of the Settlement Trust, but approval of the Pilot is critical to putting the Company’s proposed plan in place prior to the finalization of the State’s BMP. In addition, the delayed effective date will allow the Company to complete its customer outreach and select eligible customers for the Pilot once approved. The Company also requests that the Pilot has an approved duration of three years; if the Pilot is successful, the Company may seek to grow the Pilot or seek early termination of the Pilot in favor of a full scale offering to be filed with the Commission for approval. The proposed tariffs for the Pilot programs are attached herein as Exhibits B through E.

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<sup>2</sup> In 2016, Volkswagen AG agreed to spend up to \$14.7 billion to settle allegations of cheating emissions standards. Of that amount, \$2.9 billion was used to establish an Environmental Mitigation Trust, which states and territories may use to invest in transportation projects that will reduce NOx emissions. Of that amount, \$34 million was allocated to South Carolina as a beneficiary under the Settlement Trust. In April 2018, the SCDOI announced the release of the first draft of the State’s Beneficiary Mitigation Plan (“BMP”) under the Settlement Trust. Eligible mitigation actions under the BMP include replacing or repowering diesel school buses, shuttle buses, or transit buses. In addition, beneficiaries may utilize up to 15% of their total allocation on costs relating to light duty zero emission vehicle supply equipment.

During the Pilot, the Company plans to assess the market adoption of multiple types of EVs, gather data on customer charging behavior, assess customer willingness to allow the utility to manage the time and duration of charging, develop procedures to ensure new load from EV charging is integrated in a cost-effective manner and other areas that could suggest changes that would make a more widely available program successful. The Company will report operational data and results to the Commission on an annual basis, and prepare a final report with final findings and conclusions. If the Company determines that the ET Pilot is ready for wider subscription, it will propose such a program to the Commission that incorporates lessons learned from the Pilot.

The request for relief set forth within this application would not involve a change to any of DEC's retail rates or prices at this time or require any change in any Commission rule, regulation, or policy. In addition, the issuance of the requested accounting order will not prejudice the right of any party to address these issues in a subsequent general rate case proceeding. Accordingly, neither notice to the public at-large, nor a hearing is required regarding this application. In support of this application, DE Carolinas respectfully shows the Commission the following facts, and petitions the Commission for the following relief:

**Name and Address of the Company**

The correct name and post office address of DE Carolinas are:

Duke Energy Carolinas, LLC  
Post Office Box 1321  
Charlotte, NC 28201

### **Notices and Communications**

The name and addresses of the attorneys of DE Carolinas who are authorized to receive notices and communications with respect to this application are:

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### **Description of the Company**

DE Carolinas is engaged in the generation, transmission, distribution and sale of electric energy at retail in the western portion of South Carolina and the central and western portions of North Carolina. The Company also sells electricity at wholesale to municipal, cooperative and investor-owned electric utilities and its wholesale sales are subject to the jurisdiction of the Federal Energy Regulatory Commission. DE Carolinas is a limited liability company organized and existing under the laws of North Carolina, is authorized to transact business in the State of South Carolina and is a public utility under the laws of South Carolina. Accordingly, its operations in South Carolina are subject to the jurisdiction of the Public Service Commission of

South Carolina pursuant to the provisions of Chapter 27 of Title 58 of the South Carolina Code of Laws.

### **Background**

Around the country, utilities are investing in EV charging infrastructure as new vehicles enter the market and strong sales growth continues nationwide. Since 2013, over \$1B of utility investment in EV programs has been approved by state utility commissions. The proposed ET Pilot would allow South Carolina to join states along the east coast, from Massachusetts to Florida, in deploying EV infrastructure to meet the needs of this growing market. Various states around the country have embraced the expansion of electric transportation, each considering the best options for program design given differences in market development and other factors. For example, in 2017, the Florida Public Service Commission approved an EV Infrastructure Pilot proposed by Duke Energy Florida, including public Level 2 and DC Fast Charging; in New York, ConEdison is supporting the deployment of electric school and transit buses in addition to planned fast charging networks and residential customer charging research; and in New Jersey, PSE&G recently filed its Clean Energy Future proposal, which includes a \$364M EV program to deploy 40,000 networked charging stations across residential, MUD, workplace, school bus and other medium and heavy-duty segments. Electric cooperatives and municipal utilities are also actively supporting EV adoption across the United States in diverse locations, such as the Western Farmers' Electric Cooperative in Oklahoma and in Orlando, Florida, where the Orlando Utilities Commission has deployed one of the largest municipal EV infrastructure programs in the country. Other examples of states that have embraced EVs in a pilot or otherwise include Maryland, Massachusetts, Oregon, Kentucky, Ohio, and California (Exhibits F, G, H and I). In neighboring Georgia, Georgia Power has installed 25 public fast charging stations, facilitating

EV adoption across the state of Georgia. By installing DC Fast Charging stations in South Carolina, the ET Pilot would build on this neighboring network and allow EV drivers to seamlessly traverse South Carolina along the crucial I-85, I-95, and I-26 interstate corridors.

Electric vehicles are coming to South Carolina too as sales growth through the end of 2017 continued double-digit growth with a compound annual growth rate of 43% since 2011. Further, the ET Pilot would facilitate the South Carolina State Energy Plan's challenge to "Lead by Example" to increase the adoption of alternative fueled-vehicles in the state-owned fleet, by deploying electric school buses into the state-owned fleet and increasing the availability of public DC fast charging. While EVs may be coming to South Carolina, more investment is needed to facilitate market growth. Lack of charging stations is commonly cited as a barrier to purchasing an EV. Mike Smith of Electric Cooperatives of South Carolina recently completed a cross-country road trip to Utah in a Chevy Bolt EV, highlighting the opportunity and challenges of electric transportation (Exhibit J). Using the EVI-Pro Lite tool developed by the Department of Energy, the Company estimates that approximately 1,000 public direct current fast charging ("DCFC") charging plugs will be necessary by 2025 to support current forecasts of EV market growth. Currently, there are only 40 open-standard, publicly available DCFC charging plugs in South Carolina.

### **ET Pilot Design**

EV technology has advanced significantly since the Company introduced its first pilot in 2012. Since then, EVs contain much larger batteries, charge at higher demand and have expanded to multiple market segments not previously offered. Additionally, more research has been conducted to show the potential system/customer benefits of increased adoption, and the potential for utility-managed charging to optimize those benefits. Accordingly, the ET Pilot



consists of four programs designed to research and better understand the effects of an increasing adoption of ET charging infrastructure on a) the Company's bulk electric system, b) the behavior of customers and c) the potential financial and environmental benefits to the State of South Carolina. The four programs are: 1) the Residential EV Charging Load Management Program, 2) the EV School Bus Charging Station Program, 3) the EV Transit Bus Charging Station Program and 4) the DCFC Station Program.

**(1) Residential EV Charging Program**

The Residential EV Charging Program is designed to evaluate whether EV adoption can be encouraged by providing a rebate to support the installation of smart, networked Level II (208/240V) electric vehicle supply equipment ("EVSE"). Level II EVSE allows EV customers to charge their EVs up to six times faster than a standard 120V wall outlet.<sup>3</sup> Accordingly, the Company will provide a rebate and ongoing quarterly participation payments for up to 400 residential customers installing qualifying Level II charging equipment in exchange for utility management of home charging during defined hours.

This program will also be used to establish procedures to determine the value and viability of utility-managed charging in practice. In fact, based on a cost-benefit analysis conducted by M.J. Bradley & Associates, LLC ("MJB&A"), managing EV charging loads may significantly increase net customer benefits of EV charging. In the study, provided as Exhibit A,

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<sup>3</sup> EV chargers are generally divided into three market segments: (1) Level I chargers; (2) Level II chargers; and (3) DC Fast Chargers. Level I charging is generally considered to include plugging the ET into a typical 110 volt household outlet and may require nearly a full day or more to fully charge existing EVs, depending on battery capacity. Level II chargers rely on a 240 volt connection and are capable of fully charging most existing EVs in approximately 8 hours or less depending battery capacity. Lastly, DC Fast Chargers utilize direct current and are the fastest method for charging an EV. However, DC Fast Chargers are also the most expensive form of charger. Existing DC Fast Chargers permit a typical EV drive to obtain a full charge over lunch. Among these three market segments, there are numerous differences and enhanced capabilities such as smart charging or even higher capacity DC Fast Chargers.

MJB&A analyzed historical electric system data from South Carolina along with national average EV charging behavior and found that managed charging may increase statewide net customer benefits by up to \$66 million per year. As such, the Company is interested in establishing programmatic procedures and features to successfully implement utility-managed charging to bring these potential benefits to South Carolina customers.

The Residential EV Charging Program will require eligible EVSE to possess networked capabilities, which will allow the Company to collect usage characteristics of EV charging behavior, better understand potential grid and utility impacts from EV charging, and implement utility-managed charging. The proposed tariff for the Residential EV Charging Program is provided as Exhibit B.

**(2) EV School Bus Charging Station Program**

The EV School Bus Charging Program is designed to facilitate the replacement of older diesel school buses with modern, clean, zero-emission electric school buses. The State of South Carolina operates one of the oldest school bus fleets in the country, with over 500 buses model year 1988 or older. The age of these buses leads to high levels of annual NOx emissions, higher operating costs and frequent safety issues. The Company believes there is potential for significant operational (fuel and maintenance) cost savings to operators of electric school buses, diesel emissions reductions benefits and electric system benefits from the adoption of electric school buses in South Carolina. To demonstrate the value of these benefits, the Company is seeking to aid in the purchase of approximately twenty (20) electric school buses by providing rebates of up to \$125,000 each, on a first-come, first-served basis, to school districts willing to purchase an electric school bus and associated charging infrastructure with Vehicle-to-Grid

(“V2G”) power flow capabilities. The program incentive level is designed to offset a portion of the cost of the bus and related charging infrastructure.

Further, the program is designed to be complementary to the anticipated funding available for replacement of legacy diesel school buses per the Settlement Trust. As related to South Carolina’s share of the Settlement Trust, the SCDE has proposed to the SCDOI that a portion of the Settlement Trust funds be used to replace diesel school buses with either new diesel or propane school buses. The Company believes that the availability of funds from the Settlement Trust combined with the Company’s proposed rebate would yield a great incentive for SCDE to replace a limited number of the legacy school buses with zero-emission, electric school buses. In fact, by adding this utility cost-share to the same level of funding used to purchase a diesel bus (\$81,569), the program would allow SCDE to replace the same number of buses as their original proposal and further reduce net annual NOx emissions by an additional 10,400 grams per bus at no additional cost to the state. Electric school buses can also provide strong operational cost savings to SCDE, currently estimated at approximately \$144,000 annually for a deployment of 20 school buses. The Company discussed this proposed program with several parties, including the SCDOI, SCDE and Greenville School District, and received several expressions of interest.

In exchange for the rebate, the school district must agree to allow the Company to record all vehicle charging data, and perform testing of charging load management and V2G capabilities. Any load management or V2G testing will be done so as to not impede in any way the normal duty cycle of the school bus. The proposed tariff for the EV School Bus Charging Station Program is provided as Exhibit C.

### **(3) EV Transit Bus Charging Station Program**

DE Carolinas believes there are significant potential operational cost savings and overall societal benefits of electric buses to the State of South Carolina. In fact, customers such as Clemson Area Transit and Greenlink are already investing in electric transit buses. The Company's EV Transit Bus Charging Station Program will leverage local funding and previously awarded Federal Transit Administration grant funding for the procurement of electric transit buses, allowing these transit agencies to purchase additional buses, and other customer transit agencies to begin procurement of electric transit buses. Accordingly, Duke Energy proposes to provide rebates of up to \$55,000 each on a first-come, first-served basis to eligible transit agency customers electing to procure an electric transit bus for up to twenty (20) electric transit bus charging stations. In exchange for the rebate, the transit agency will allow the Company to record all vehicle charging data, and perform testing of utility-managed charging capabilities. Any utility-managed charging testing will be done so as to not impede in any way the normal duty cycle of the bus. The proposed tariff for the EV Transit Bus Charging Station Program is provided as Exhibit D. The Company has estimated annual cost savings of approximately \$1M will accrue to SC transit agencies resulting from the deployment of 20 electric transit buses.

#### **(4) DC Fast Charging Station Program**

Difficulty in traveling long distances is a commonly cited customer concern with EVs, and there are currently a limited number of publicly available fast chargers in South Carolina. The limited revenue potential due to the current EV population and the high upfront cost of fast charging installations—particularly at highway corridor locations where they are most needed—results in challenging economics, leading to few installations. The Company believes that a utility is well-suited to deploy a foundational level of fast charging infrastructure to facilitate long-distance travel throughout the service territory. As a long-term owner-operator of power

infrastructure, a utility has expertise in ensuring assets are used and useful for public benefit throughout the full useful life of the asset. Without owning the charger, a utility cannot ensure that customer-funded chargers remain well-maintained and useful for the long term. Further, the Company believes that a utility can also ensure that fast chargers are located such that they are available to all customers rather than only to those of demographics or locations that are early adopters of new technology.

Accordingly, the Company proposes to install, own and operate up to twenty (20) DC Fast Charging (“DCFC”) stations across DE Carolinas’ SC territory to provide a foundational level of infrastructure and facilitate EV market growth. The DCFC Stations would be installed, operated and maintained by a Duke contractor and may be co-located with other automotive facilities to reduce the installation cost. The DCFC stations would either be located on company-owned or third-party owned property, including but not limited to truck stops, gas stations, restaurants and other retail establishments. Station locations would be dispersed at key highway corridor locations throughout Company’s service territory to enable intra- and inter-state electric vehicle travel.

Currently, the market for public DC fast charging in South Carolina is limited, with only three operators charging drivers a fee for the service. Because the Company wants to facilitate the continued growth of DCFC accessibility, the Company realizes that it must charge a fee to customers to use the stations at a price that is comparative to the current market rate for electric vehicle charging in South Carolina. To charge less would undercut the market; to charge more would reduce the incentive for drivers to use the Company’s stations. Therefore, this method provides a clear and stable price signal to consumers while also encouraging further market growth from other third-party operators. To accomplish this, the Company plans to sample the

market price (\$/kWh) for EV charging, on a quarterly basis, and then charge customers the approximate average price per kWh. For example, as sampled on July 1, 2018, the average price for the 23 DCFC stations that charge a fee to drivers for use of the station is approximately \$0.236/kWh, which would be the rate the Company would charge drivers at the Company's DCFC until the next sampling on October 1, 2018. The Company proposes that the difference between the rate charged to EV drivers and the cost of electricity to serve the DCFC stations would offset the regulatory asset accrued to fund the program. Accordingly, this method ensures that utility-owned stations not only avoid undercutting market, but may allow EV drivers to pay down a portion of the capital and ongoing operating costs necessary to fund the stations. As noted above, however, the proposed method of calculating the rate is not expected to fully recover the cost of providing the Station. The proposed tariff for the DCFC Station Program is provided as Exhibit E.

### **ET Pilot Program Eligibility**

DE Carolinas proposes the following eligibility criteria for each ET Pilot program:

- **EV Charging Load Management Program:** Program availability is on a voluntary basis, at the Company's sole option, to no greater than 400 residential customers receiving electric service from the Company. Participants are required to submit an application and must own, lease or otherwise operate on a regular basis a plug-in electric vehicle intended for use on public streets and highways. A plug-in vehicle includes plug-in hybrid and battery electric vehicles.
- **EV School Bus Charging Station Program:** Program availability is on a first-come, first-served basis, at the Company's sole option, to non-residential customers receiving electric service within the Company's South Carolina service territory. Customers must operate a public school transportation system utilizing one or more electric vehicle school buses. Incentives are available for no more than 20 buses which may be owned by a single or multiple school systems.
- **EV Transit Bus Charging Station Program:** Program availability is on a first-come, first-served basis, at the Company's sole option, to non-residential customers receiving electric service from the Company. Customers must operate a commercial

transit system utilizing one or more electric vehicle transit buses. Incentives are available for no more than 20 charging stations which may be owned by a single or multiple transit systems.

- DC Fast Charging Program: Charging services will be available to all electric vehicle owners without preference to the Company's electric service customers.

### **Data to Be Collected During the Pilot**

As described herein, the ET Pilot will permit DE Carolinas to assess the different charging load profiles from residential EV charging, DCFC, transit bus charging, and school bus charging in South Carolina. The ET Pilot also seeks to establish the extent to which utility-managed charging can shape charging behavior and the value of doing so for residential and public transit operator customers. Further, the Pilot will allow the Company to investigate the capabilities of school buses to provide V2G power and resilience benefits as potential mobile backup power sources. Realized cost savings along with program costs and benefits will also be compared to inform future regulatory and policy proceedings related to realizing the economic and ratepayer benefits of transportation electrification.

To the extent possible in keeping with protecting customer privacy, aggregated data will be made available to the public through a final report filed with the Commission within 180 days after program end. The final report shall include but is not limited to: overall cost figures, load profiles of residential, DCFC and public transit charging; cost savings of public transit agencies; information about charging station costs; insights learned by the Company regarding the effect of the program on the electric vehicle supply equipment ("EVSE"); and EV market development in South Carolina.

### **Customer Communications and Information**

DE Carolinas will conduct market education and outreach for each program, similar to existing energy efficiency and demand response programs, including electronic communications, direct mail, social media, public event, and mass market advertising. The Company will also leverage relationships with agencies and organizations, such as Palmetto Clean Fuels and environmental NGOs that have supported Duke Energy's electric transportation efforts in other jurisdictions.

### **Financial Consequences of the Request**

The Company respectfully requests Commission approval to defer the aforementioned costs associated with the ET Pilot until the Company's next rate case. The requested deferral will allow the Company to bridge the timing gap until the Companies' next rate case while conducting a pilot that will allow the Company to better understand the impacts and benefits of accelerated deployment of EV technology while simultaneously advance the adoption of EVs and the deployment of electric transportation infrastructure for the good of the State of South Carolina. Without the accounting treatment requested by the Company, the Company will not be able to match the ET Pilot expenses with revenue to be collected in new Commission approved base rates. With such a mismatch of expense to revenue, this event would be a departure from the fundamental "matching principle" in financial accounting. Accordingly, absent the deferral, the Company may not be able to make the investments until such time they can be recovered.

### **Conclusion**

As described herein, the ET Pilot is designed to determine best practices for realizing the significant potential benefits of increased electric transportation adoption in South Carolina, including customer benefits from increasing electric system utilization and economic benefits



from retaining fuel cost savings in the state, improving the state energy trade balance, and deploying cutting-edge vehicle technology. Accordingly, DE Carolinas respectfully requests that the Commission:

1. Approve the ET Pilot as a three-year pilot 60 days from the date of this filing to become effective 90 days from the date of Commission approval.
2. Authorize the Company to defer in a regulatory asset the related depreciation expense, property tax, and incremental O&M expenses, as well as the carrying cost on the investment and on the deferred costs at its weighted average cost of capital, incurred in connection with the ET Pilot until the Company's next general rate case.
3. Find that the ET Pilot may be put into effect without notice or hearing pursuant to the provisions of S.C. Code Ann. § 58-27-870(F).

Respectfully submitted this 10<sup>th</sup> day of October, 2018.




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